**Grade 7: RATIO/FRACTION INVESTIGATION**

**PART 1: Comparing the lengths of polygons**

1. **Comparing the lengths of each side of a triangle**

Each side length of the two triangles are in the same ratio.

6 cm

3 cm

8 cm 4 cm

Big Triangle Small Triangle

1. a. How many times longer are the sides on the big triangle than the sides on the small triangle?
2. Compare the lengths of the small triangle to the big triangle using ratios.
3. Put your ratios in simplest form.
4. What do you notice when you simplify both ratios?
5. a. Using a **fraction** compare the lengths of the small triangle to the big triangle?
6. Compare the side lengths using fractions.
7. Put your fractions in simplest form.
8. What do you notice when you put both fractions in simplest form?

3.

6 cm *x* cm

3 cm 5 cm

8 cm 4 cm

Bigger Triangle Smaller Triangle

1. Use the **ratio you found in question 1** to find the missing side***x***? Show your reasoning.
2. All sides reduce to the **same** or **equivalent fraction** in question 2. Use the fraction you found in **question 2** to solve the length of ***x.***
3. Did you get the same answer for ***x*** in question 3 and 4? **Why?**

**b: Comparing the lengths of each side of a rectangle**

***Each side length of the two rectangles are in the same ratio.***

5cm

3 cm

15cm

1. How many times longer are the sides on the big rectangle to the small one?

Show using a **ratio**.

1. Compare the side lengths using a fraction. Use numbers provided.

***Each side length of the two rectangles is in the same ratio.***

5cm  ***x* cm**

3 cm

15cm

1. Find ***x***? Show all working.
2. using ratios
3. using fractions
4. Below are three shapes**.** Use **ratios or fractions** to find missing side lengths. Show work!!!

**Parallelogram**

2cm

***x*** cm

6cm **Ratio 2:1** x = \_\_\_\_\_\_\_\_\_\_

***y*** cm y = \_\_\_\_\_\_\_\_\_\_

**Working**

**Square *x*** cm

4cm

**Ratio 1:3**

x = \_\_\_\_\_\_\_\_\_\_

**Working**

**Isosceles Triangle**: (two sides are equal)

3cm 3cm

**Ratio 1:4 *x*** cm  ***y*** cm x= \_\_\_\_\_\_\_\_\_\_\_

1cm y = \_\_\_\_\_\_\_\_\_\_\_

z = \_\_\_\_\_\_\_\_\_\_\_

**Working** ***z*** cm

**PART 2: Comparing the areas of polygons**

1. Now go back to the triangle in **PART 1** andfind the area of each **triangle**.

**NOTE: Area of a triangle is **

Area of Small Triangle = Area of Big Triangle=

1. Using fractions in simplest form compare the **area of each** **triangle** from **Small to Big**. Write them down.
2. Now go back to the rectangle in **PART 1** andfind the area of each **rectangle.**

**NOTE: Area of a rectangle is** 

Area of smaller rectangle = Area of bigger rectangle=

1. Using fractions in simplest form compare the **area of each** **rectangle** from **Small to Big**. Write them down.
2. Go back to the fractions you found in **part 1**, for the **triangle** and the **rectangle** and fill in the table below:

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Side length** **(S)** fraction Small to Big | **Area (A)**fraction  Small to Big | Pattern |
| Triangle |  |  |  |
| Rectangle |  |  |  |

1. In **words** state the relationship that you found.
2. Can you find a general rule to link the fractions found in **Part 1** to those found in **Part 2**?

Eg. Side length (S): 

Area (A): 

General Rule: State as **fractions** the relationship between side length and areas of a figure.

1. Show by example—Test your general rule works on the smaller and larger squares below with side lengths 2cm and 8cm

2cm 8 cm

**Work:**